In the very thin shell of the Earth's crust are found many minerals. Because of their purity, scarcity, or social value, some minerals are called gems.

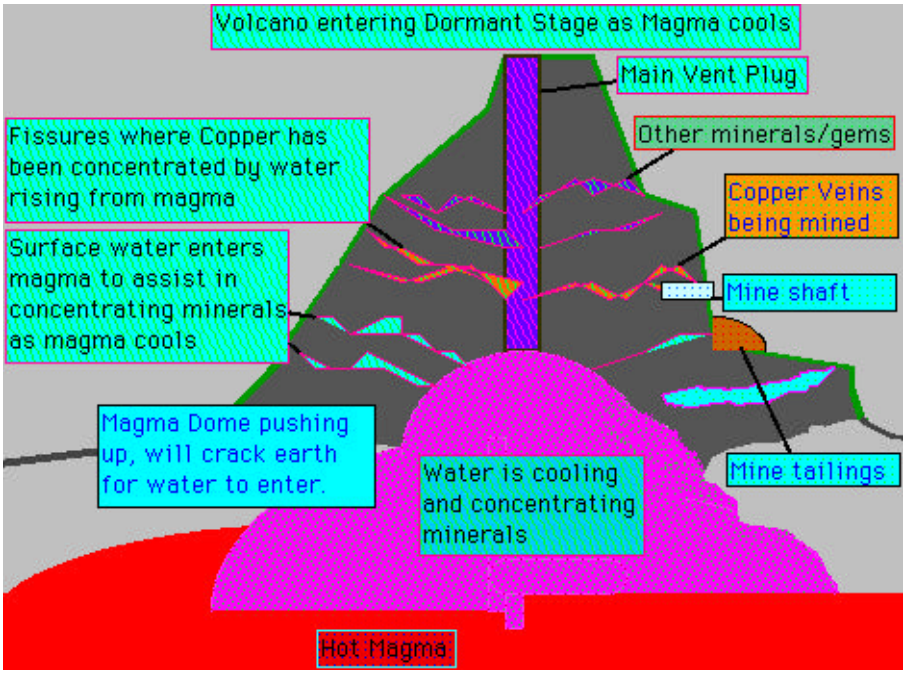
Minerals share five common characteristics:

1. They occur naturally in the earth or in other words the earth makes them.
2. They are inorganic meaning they have never been living.
3. They have a definite chemical composition.
4. They are always found as a solid.
5. The atoms of the mineral are arranged in a definite, repeating pattern, which is called a crystal.

The earth uses gravity to generate heat and pressure which sorts minerals by density. Later, chemical bonds form which also create different densities of rocks. Gravity then does more sorting by pulling the more dense objects closer to the earth's core.

Volcanoes are nature's method of naturally refining and sorting minerals. Precious minerals such as copper, silver, gold, and iron are in solution within the magma, which is deep within the earth. In solution, these minerals are in such low concentrations that they cannot be mined unless the magma is to harden.

Water now becomes very important in the smelting process within the earth. Many of the most important mines in the early history of civilization such as Cyprus, relied upon copper for tools. Surface water and precipitation naturally seep into the earth's crust as the magma cools and openings form. The cooling and condensing of the magma create the cracks, fissures, and vents produced by the seeping water. This can occur in a surface volcano or an underwater "smoker". The water bonds to the copper in solution, and then carries the precious mineral back up the cracks, fissures or vents where it then hardens. The mineral is now in a higher concentration than it was in the magma.



Ancient miners did not understand this process within the earth, but they understood that if they dug a horizontal shaft into a vent or fissure at the right depth they would find copper. At another depth they would find silver. They became experts in understanding how to get Mother Earth to yield her concentrated mineral. They found that some minerals were found in association due to similar densities, such as platinum and iron deposits.

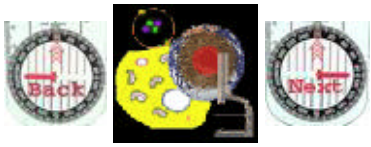
Prospectors in search of precious minerals found that the most convenient locations to find precious minerals were in the vents of ancient volcanoes.

- Why would this be?
- What mineral is found in volcanic activity near Cedar City?
- What mineral is found in a volcanic vent in the Oquirrh Mountains west of Salt Lake City?
- What minerals used to be mined in old volcanoes around Park City east of Salt Lake City?

- What minerals or gems do you know of that have been mined from other volcanic vents in the west desert of Utah?

The most common minerals of early man were iron, copper, silver, and gold. Almost without fail these minerals are concentrated in volcanic vents and fissures.

On your own, research, then list the precious metals along with the dormant volcanos associated with them that are found in Utah.



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